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ESH and manual

Environment, Safety, and Health

Volume I

Part 3: Safety Analysis and Work Plans and Procedures

Document 3.3
Facility Safety Plans and Integration Work Sheets with Safety Plans

Recommended for approval by the ES&H Working Group

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Deputy Director for Operations

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3.3

Safety Plans*

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* **Editorial Revision**

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Facility Safety Plans and Integration Work Sheets with Safety Plans

1.0 Introduction

1.1 Purpose and Scope

This document contains the requirements for developing, reviewing, approving, distributing, and updating Facility Safety Plans (FSPs) and Integration Work Sheets with Safety Plans (IWS/SPs) to provide Laboratory-wide consistency in the way these documents are used to manage work. The requirements specified in this document apply to anyone who has responsibility for developing, reviewing, or authorizing FSPs and IWS/SPs.

FSPs are facility-specific documents and are required for hazard-ranked facilities above the classification of general industry The new minimum content for FSPs is not required until the revision's next three-year review cycle. IWS/SPs are project-specific documents and are required for all Work Authorization Level C (WAL C) work.

A new Safety Plan form (SP) has been introduced that can be completed and used as an addendum to an Integration Work Sheet (IWS), serving as a replacement for the Operational Safety Plan (OSP). OSPs are being phased out and replaced with IWS/SPs when an OSP comes due for renewal (three years from it's initial approval date) or prior to the next renewal if a major revision is required. See the implementation schedule in Document 2.2, "Managing ES&H for LLNL Work," in the *ES&H Manual.*

It should be noted that work associated with the Superblock is covered by the Superblock Work Control/Design Change Control Process Manual and shall follow the requirements stated therein and use of IWSs or conversion to IWS/SPs is optional.

1.2 Overview of the Safety Plan Process

If an FSP is required because of the nature of the facility or if the IWS process indicates the need for the addition of a safety plan, prepare either document according to the following steps:

- Write the document following the instructions given in this document.
- Obtain the necessary reviews.
- Obtain the required concurrence and authorization.
- Distribute the document to the affected individuals and organizations.

- Implement controls specified in the document.
- Update and renew the document as needed.

The steps in this process are described in more detail in the sections below. Contact your ES&H Team to establish a specific timeline for processing an FSP or IWS/SP.

1.3 Personnel to be Used as Resources when Writing Safety Plans

During the process of writing the safety plan, the Responsible Individual, facility manager, or their designee should obtain direction and assistance from personnel in the following groups:

- Cognizant workers
- Program management
- Facility management
- The ES&H Team and through the team, other subject-matter experts

These people can assist with the following:

- Identifying significant hazards
- Identifying applicable ES&H policies and standards
- Tailoring controls to the work, and evaluating risk and effectiveness of controls
- Formatting the safety plan
- Identifying facility safety basis requirements and limitations
- Identifying the existence of directly related ES&H documentation
- Assuring that the project conforms to the facility's authorization basis

2.0 Development and Management of Facility Safety Plans

2.1 Facility Safety Plan

An FSP is a facility-specific document that outlines the methods for controlling and minimizing the ES&H hazards and risks identified in safety basis reports (e.g., Safety Analysis Reports, Hazard Analysis Reports, or Screening Reports) and other ES&H evaluations for a facility. An FSP is required for facilities with a hazard classification greater than Light Science and Industry. This includes:

- Low Hazard facilities

- Radiological facilities
- Accelerator facilities
- Moderate Hazard facilities
- Explosives facilities
- Category 3 Nuclear facilities
- Category 2 Nuclear facilities

See Document 3.1, "Safety Analysis Program," in the *ES&H Manual* for more information on the LLNL hazard classification system.

The facility manager or his or her designee typically will draft the FSP. The minimum content as applicable for an FSP is provided in Appendix A. Additional topics may be required as determined by facility management and the ES&H Team. The content and level of detail within each section is dependent on the operations in the facility, as determined in the review and authorization process. FSPs may reference other documents containing relevant information as long as those documents are readily available to facility personnel

It is the facility manager's responsibility to ensure that the FSP complies with the applicable facility safety basis envelope requirements, environmental permit limits and requirements for facility-related operations. The FSP shall also contain a description of the method used to make sure that the facility stays within operational limits established in the safety basis documents.

See Figure 1 for a flowchart on the FSP development process.

2.2 Initial Review of the Draft Facility Safety Plan

All draft FSPs shall undergo an initial review to ensure that the work, associated hazards, and environmental concerns are properly identified, evaluated, and controlled and that they meet ES&H requirements. Prior to transferring the draft to the ES&H Team for review, the document author should have the document reviewed within his or her organization as deemed necessary.

The draft FSP is transferred to the appropriate ES&H Team who assigns a number to the plan and arranges for the ES&H Team review. The ES&H Team distributes the document to the appropriate discipline staff for review and coordinates the incorporation of comments into the document. The ES&H Team reviewers shall determine whether the safety plan adequately describes the hazards and controls so that the work can be performed safely and in an environmentally sound manner. The draft FSP may require a special review for some hazards. See Appendix B for a list of

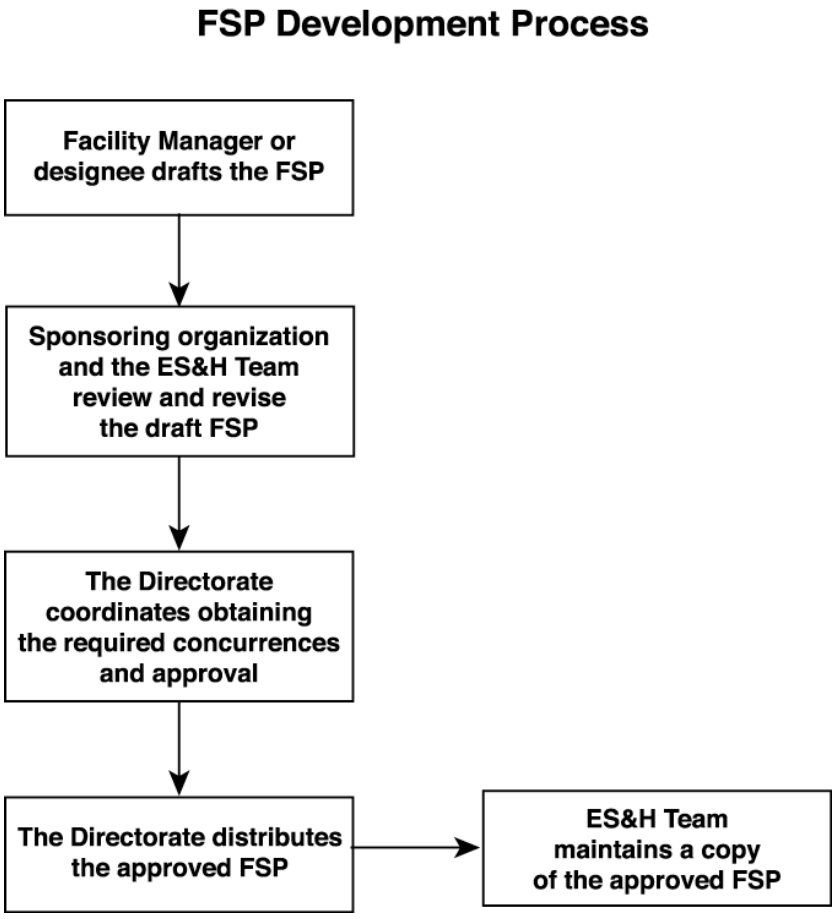

Figure 1. Facility Safety Plan Development Process

hazards requiring special review. The ES&H Team reviewers are responsible for assuring that the controls from the *ES&H Manual*, applicable Work Smart Standards (WSSs), and Lessons Learned are incorporated into the FSP.

The reviewers may contact the author(s) of the FSP if additional information, clarification, or field evaluation is required. Reviewers may designate others to perform the review, but they retain responsibility for the effectiveness and timeliness of the review process.

2.3 Facility Safety Plan Concurrence and Approval

The Directorate shall coordinate obtaining concurrence and approvals of FSPs. An FSP requires the concurrence of the ES&H Team Leader and facility management. The site manager shall also concur at Site 300 and the Nevada Test Site (NTS). The facility associate director shall approve the FSP. FSPs remain in effect for three years until the end of the month in which they expire, unless a major revision occurs first or the FSP is extended.

2.4 Familiarization and Distribution of the Approved Facility Safety Plan

Individuals routinely working in a facility shall be familiar with the applicable content of the FSP and document this fact on a Safety Plan Review Form. See Appendix C for a copy of the Safety Plan Review Form. The facility manager is also responsible for making the document available to building occupants and concerned parties (e.g., RIs, program/project leaders, and personnel from supporting organizations like Plant Engineering) in the work area.

2.5 Facility Safety Plan Record Storage

Hazards Control Department shall maintain permanent records of FSPs for 75 years. All inactive documents shall be archived. The facility manager shall provide copies of the FSP to the ES&H Team. An electronic record storage system may be used.

2.6 Changes to an Approved Facility Safety Plan

The facility manager or his or her designee may initiate any required changes to an approved FSP at any time. These changes shall be made using a Safety Plan Change Memo Form (see Appendix D.) The facility manager shall provide copies of all Safety Plan Change Memos to the appropriate ES&H Team, and current FSP holders.

Two types of FSP changes are distinguished:

2.6.1 Facility Safety Plan Minor Change

A minor change is defined as:

- Typographical corrections
- Other changes that do not potentially impact safety, or
- Changes that improve the safety

The facility manager can make a minor change. Consultation with the ES&H Team is encouraged to assure that the change fits within the minor change category. Copies of the Safety Plan Change Memo noting the minor change shall be sent to the facility AD, ES&H Team Leader, site manager, FPOC, and affected personnel (if applicable). The original document shall be marked with the minor change date and the original document shall have the changes made on the document. No further distribution of the change is required**.**

2.6.2 Facility Safety Plan Major Change

Any change that is not a minor change is defined as a major change. Examples of a major change are:

- A change in the facility-specific hazards or controls, or
- Any change that results in an increased risk

A major change requires the same level of concurrence and approval as the initial document required. A revision number is assigned to the document to denote that a change has been made. The Safety Plan Change Memo noting that a major change has occurred is distributed to all concerned parties. The original document shall be marked with the major change date and the original document shall have the changes made on the document. The Safety Plan Review Form shall be re-signed by all concerned reviewing parties. When the changes are extensive and the entire document has been thoroughly reviewed, a new expiration date of up to three years may be assigned.

See Figure 2 for a flowchart on the FSP change process.

2.7 Facility Safety Plan Periodic Reviews—Annual, Tri-Annual, and Extensions

FSP should be updated whenever a change is required. At minimum, every 12 months a review by the facility manager is required to determine if changes are necessary. When the changes are extensive and the entire document has been thoroughly reviewed, a new expiration date of up to three years may be assigned. In addition, the facility manager shall initiate tri-annually a full review process to renew the FSP for an additional three years. More details on these reviews are as follows:

2.7.1 Facility Safety Plan Annual Review

Every 12 months the facility manager or his or her designee shall review the FSP to determine if changes are needed. The facility manager shall document the annual review on the Safety Plan Review Form. If no changes are required, further review is not needed.

2.7.2 Facility Safety Plan Tri-Annual Review and Six-Month Extension Period

FSPs shall be approved for three years and must be reviewed and updated or extended prior to the end of that period. If an extension is determined to be required, the facility manager shall prepare an FSP extension memorandum. The facility associate director and the ES&H Team Leader (or their designee) may authorize a one-time extension of an FSP for up to six months. The facility associate director and

the Hazards Control department head (or their designee) must approve additional extensions. The facility manager is responsible for ensuring that the approved FSP extension memorandum is distributed to the current FSP holders.

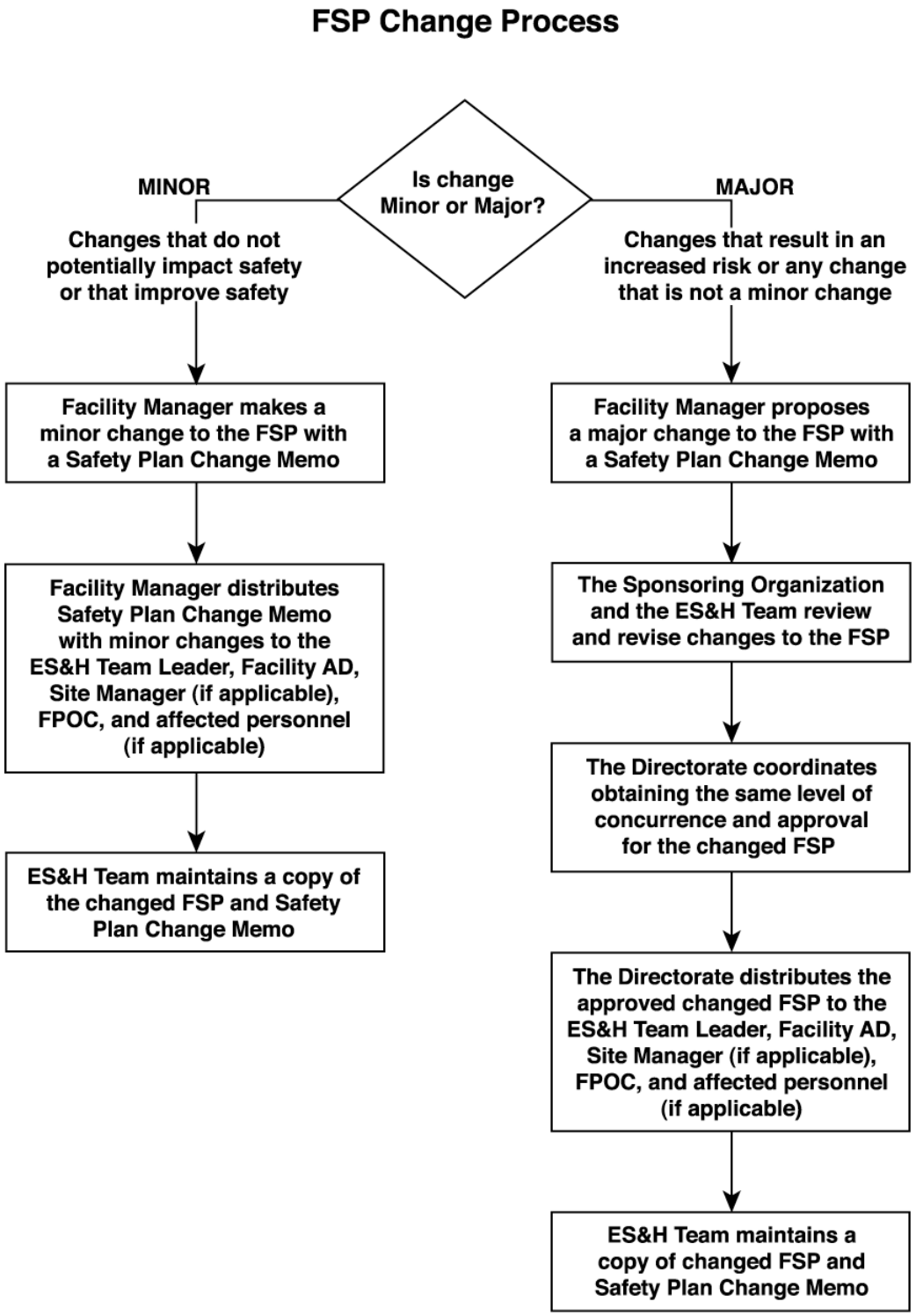

Figure 2. Facility Safety Plan Change Process.

The information in the revised FSP shall be updated and receive the same level of concurrence and approval as required by the initial review. The Safety Plan Review Form shall be re-signed by individuals routinely working in the facility.

See Table 1 for a summary of the FSP task responsibilities.

Table 1. Facility Safety Plan Task Responsibilities.

Persons Responsible for the Task	Task To Be Performed
Facility manager or his or her designee shall:	• Draft the FSP. • Ensure that the FSP complies with the safety basis envelope for the facility. • Assure that the cognizant workers, program management, and facility management review the document. • Assure that a Safety Plan Review Form is completed to document that affected personnel have been familiarized with the changes. • Initiate the annual and tri-annual review, and major or minor changes as needed. • Assure that approved changes are included in the copy of the FSP that is available in the work area. • Provide copies of the Change Memos and FSPs to the ES&H Team and current FSP holders. • Sign as the FSP preparer and approve minor changes.
ES&H Team shall:	• Assign a number to the plan. • Route a draft copy of the plan to the designated reviewers, including the appropriate ES&H discipline members. An environmental analyst shall be included in the review. • Assure controls from the applicable Lessons Learned not covered by other safety documentation are appropriately incorporated. • Determine whether the safety plan adequately describes the hazards and controls so that the work can be performed safely and in an environmentally sound manner. • Determine whether the safety plan complies with the Laboratory's ES&H requirements. This includes confirming that the applicable controls in the WSSs have been incorporated, as appropriate. • Contact the facility manager for the FSP if additional information, clarification, or field evaluation is required. • Maintain a record of all changes. • The ES&H Team Leader shall concur on FSPs, major changes to FSPs and extensions.
Site 300 or NTS site manager	Shall concur on the FSP in their areas.
Facility Associate Director	Shall approve the FSP, major changes to the FSP, and extensions.

3.0 Development and Management of Integration Work Sheets with Safety Plans

All work at LLNL beyond activities commonly performed by the public must be authorized with an IWS. Depending on the level of hazards associated with the activity, an SP may be required. IWS/SPs are project-specific safety plans and are required for all WAL C work. Examples of activities that are designated as WAL C work warranting an SP are outlined in Document 2.2. Final determination of the need for a safety plan should be made through consultation with the ES&H Team and program management.

When the IWS process indicates a need for an SP, the person designated by the authorizing organization prepares the plan. Typically, this is the Responsible Individual. The requirement for an SP to accompany the IWS can be met by:

- Attaching a completed **Safety Plan Form.** The Safety Plan Form is not a stand-alone document but instead supplements the IWS with additional information. The Safety Plan Form is presented in Appendix E; or
- Attaching a current **Operational Safety Plan (OSP)** covering the work described in the IWS. It should be noted that existing OSPs are being phased out and replaced with IWS/SPs when they come due for a major revision or 3 year renewal; or
- Attaching or referencing the applicable sections of a **Facility Safety Plan (FSP)** covering the work described in the IWS. A copy of the FSP shall be available to personnel if sections of the FSP are referenced in the IWS.

The Safety Plan addendum shall at minimum supplement the IWS information with the following:

- **Quantities of Hazardous or Radioactive Materials and Equipment that Present a Hazard—**List or describe the hazardous or radioactive materials and or equipment that present a hazard and are planned for use. Include estimated quantities and storage locations as relevant to the hazard assessment.
- **Potential Accidents and Consequences—**Identify potential accidents, as appropriate. If there were no controls, describe the possible consequences.
- **Key ES&H Limits—**Identify key ES&H limits, such as limits established to keep operations within the safety basis envelope, or to retain compatibility with other nearby operations. In the case of hazardous or radioactive materials, describe the method used to stay within these limits. Include operational exposure limits, and hazardous energy limits, such as temperature, pressure, and voltage.

- **Hazards and Controls—**Provide further details on the hazards and controls identified in the IWS as requiring a Safety Plan addendum, noting how the hazards will be mitigated. Controls may include engineering controls (e.g., interlocks, alarms, shielding, etc.), administrative controls (e.g., procedures, signs), and personal protective equipment (e.g., gloves, lab coats, respirators, etc.). Use engineering controls, when needed and preferentially.
- **Maintenance, Inspections and Quality Assurance—**Describe any maintenance, inspections, calibration, or quality assurance activities that are necessary to maintain the required controls. Identify the safety systems uniquely associated with the activity that must be operational for the work to be performed.
- **Emergency Response Plans and Procedures—**Describe any special actions that need to be taken in the event of an abnormal situation or accident to this operation including those listed as potential accidents noted above.
- **References—**List any applicable FSPs, applicable Engineering Safety Notes, operating procedures, Safety Basis documents, or other relevant documents.

The Safety Plan addendum to the IWS may be generated using an electronic system or a hard copy equivalent.

See Figure 3 for a flowchart on the IWS/SP development process.

3.1 Initial Review of the Draft IWS/SP

All draft IWS/SPs shall undergo an initial review to ensure that the work, associated hazards, and environmental concerns are properly identified, evaluated, and controlled and that they meet ES&H requirements. Prior to transferring the draft to the ES&H Team for review, the document author should have the document reviewed within his or her organization as deemed necessary.

The draft IWS/SP is transferred to the appropriate ES&H Team who assigns a number to the plan (if it has not already been assigned a number via the electronic system) and arranges for the ES&H Team review. The ES&H Team distributes the document to the appropriate discipline staff for review and coordinates the incorporation of comments into the document. The ES&H Team reviewers shall determine whether the IWS/SP adequately describes the hazards and controls so that the work can be performed safely and in an environmentally sound manner. The draft IWS/SP may require a special review for some hazards (see Appendix B). The ES&H Team reviewers are responsible for ensuring that the controls from the *ES&H Manual*, applicable WSSs, and Lessons Learned are incorporated into the IWS/SP.

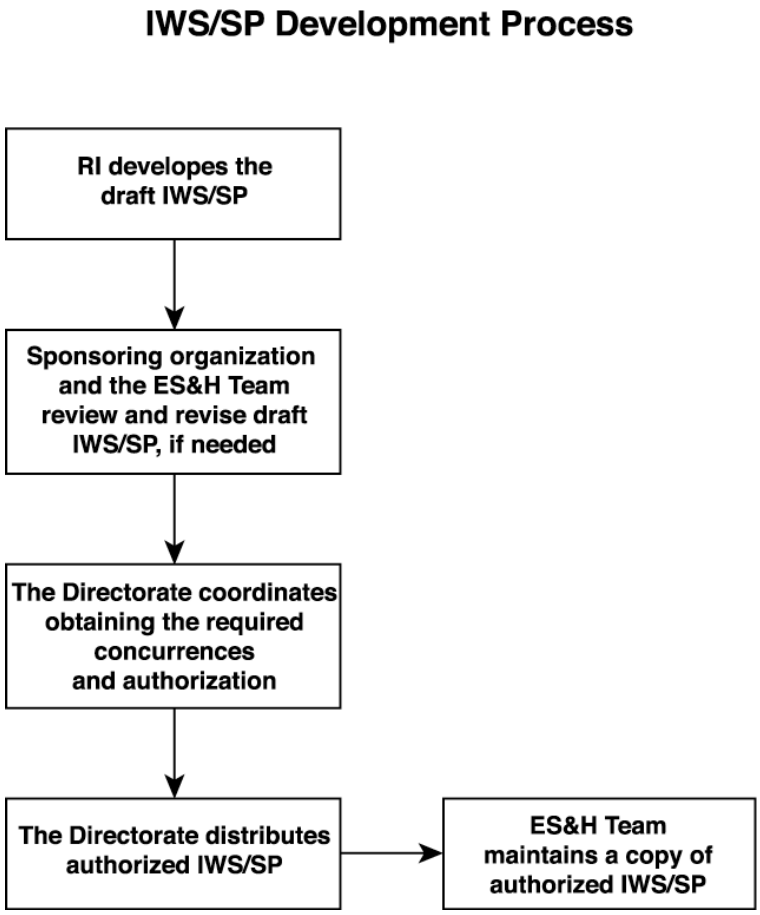

Figure 3. IWS/SP Development Process.

3.2 IWS/SP Concurrence and Authorization

Concurrence—An IWS/SP requires concurrence by the ES&H Team Leader and the facility point of contact (FPOC). The site manager shall also concur at Site 300 and NTS.

Authorization—Work described in an IWS/SP shall be authorized by the authorizing individual by signing the final document. An IWS/SP remains in effect for three years until the end of the month in which it expires, unless extended or a major revision occurs. A major revision requires a new review of the entire document and will remain in effect for three years.

3.3 Distribution of the Authorized IWS/SP

All individuals involved in the activity shall read the IWS/SP and document the fact that they have read it on a Safety Plan Review Form or an equivalent electronic system.

A prestart review conducted by the AI or their designee shall occur before work is started. See Document 2.2 for more information on prestart reviews.

See Appendix C for a copy of the Safety Plan Review Form. The Responsible Individual shall assure that affected personnel have read and agree to comply with the IWS/SP. The Responsible Individual is also responsible for making the document available to individuals involved in the activity.

3.4 IWS/SP Record Storage

The ES&H Teams shall maintain permanent records of the IWS/SP for 75 years. All inactive documents shall be archived. The Responsible Individual shall provide copies of the signed Safety Plan Review Form and IWS/SP to the ES&H Team or use an equivalent electronic system.

3.5 Changes to an Authorized IWS/SP

Changes to an authorized IWS/SP can be one of two types:

3.5.1 IWS/SP Minor Change

A minor change is defined as:

- Typographical corrections
- Personnel changes
- Start or stop date changes
- Title changes
- Other changes that improve safety or that do not adversely affect safety or the environment

The Responsible Individual can make a minor change. Consultation with the ES&H Team is encouraged to assure that the change fits within the minor change category. The original document shall be marked with minor change date and the original document shall have the changes made to the document. An equivalent electronic system may be used. The ES&H Team, FPOC, authorizing individual, and affected personnel (if applicable) shall receive a copy of the amended document. No further distribution of the change is required.

3.5.2 IWS/SP Major Change

Any change that is not a minor change is defined as a major change. Examples of a major change are:

- A significant change in the scope of work
- A change in the work location
- Changes in the hazards or controls that may adversely affect safety or the environment
- Changes in operations that increase the hazard level or introduce additional hazards
- Changes that decrease safety

A major change requires the same level of concurrence and authorization as required by the initial document review. A revision number is assigned to the document to denote that a change has been made. The revised document is re-distributed to all concerned parties. A major change resets the expiration date to three more years if a complete review has occurred. See Figure 4 for a flowchart on the IWS/SP change process.

3.6 Periodic Reviews of IWS/SPs—Annual and Tri-Annual and Extensions

3.6.1 Annual Review

Every 12 months the Responsible Individual or his or her designee in consultation with the ES&H Team Leader or designee shall review the IWS/SP with authorized workers to determine if changes are needed. If no changes are required, no further review is needed. A record of this review shall be documented on the Safety Plan Review Form or in an equivalent electronic system

3.6.2 Tri-Annual Review and a Three-Month Extension Period

IWS/SPs shall be renewed every three years and the information in the document updated at that time as needed. The document shall be re-reviewed and the FPOC, ES&H Team Leader, and site managers (if applicable) shall re-concur on the document. The authorizing individual shall re-authorize the document.

With concurrence of the facility manager or designee and the ES&H Team Leader, the authorizing individual who authorized the IWS/SP may provide a one-time extension of up to three months. The cognizant associate director and the head of the Hazards Control department (or their designee) must approve additional extensions beyond three months.

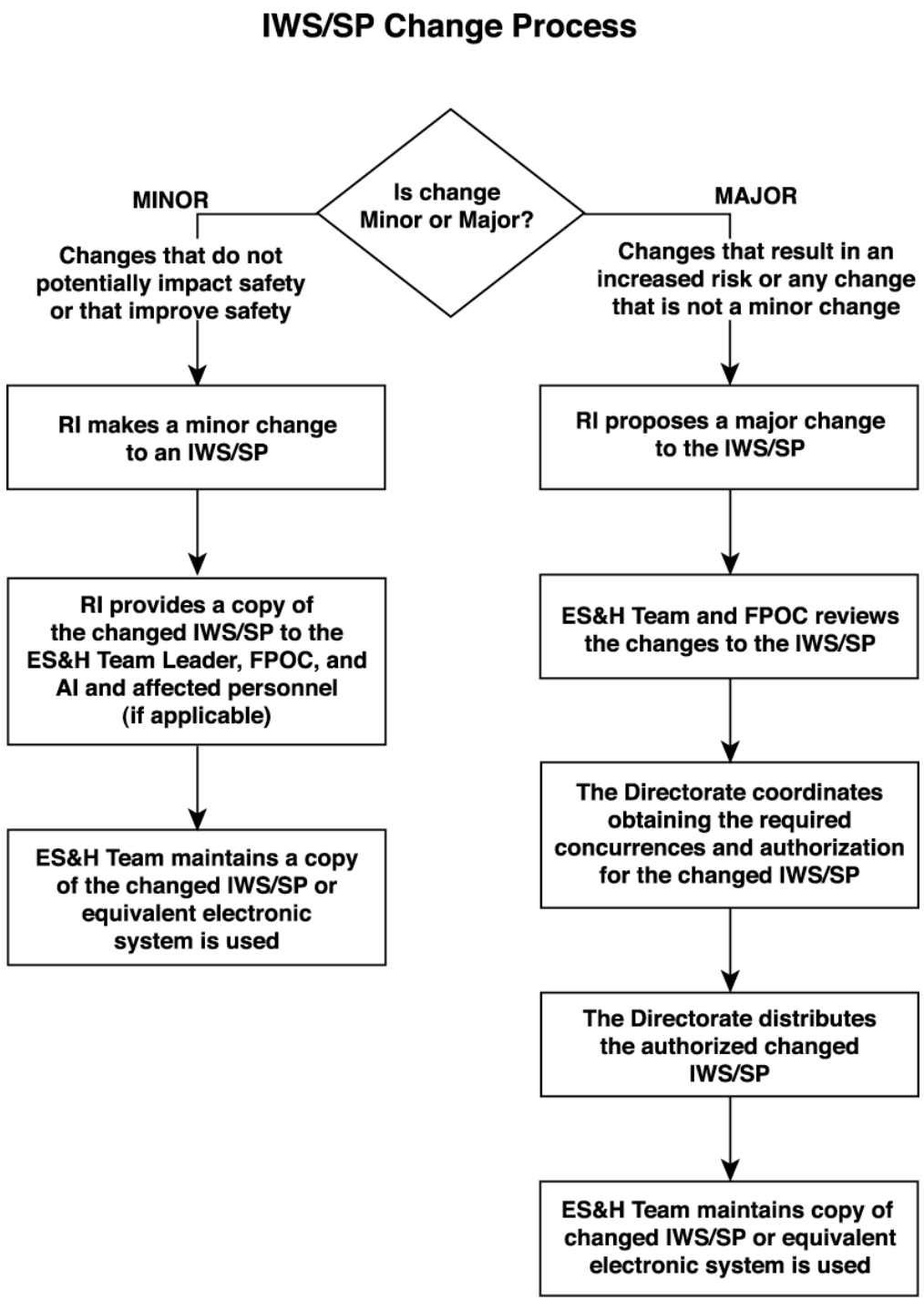

Figure 4. IWS/SP Change Process.

3.7 Termination of IWS/SPs

Upon either the termination of this safety plan or completion of the project that it covers, Facility Management or the responsible individual shall comply with Document 12.7, "Shutdown or Transfer of Facilities, Operations or Associated

Equipment." The ES&H Team shall be notified of plan to end the project and shall be responsible for archiving the IWS/SP.

See Table 2 for a summary of the IWS/SP task responsibilities.

Table 2. IWS/SP Task Responsibilities.

Persons Responsible for the Task	Task To Be Performed
Responsible Individual shall	• Draft the IWS/SP (or delegate the task) using the format provided in this document. • Assure that a Safety Plan Review Form (or an electronic equivalent) is completed to document that affected personnel have read the IWS/SP and agree to comply. • Provide copies of the signed Safety Plan Review Form, Change Memos, and IWS/SPs to the appropriate Assurance Office or use an equivalent electronic system. • Initiate the annual and tri-annual review, and major or minor changes as needed. • Concur on the IWS/SP.
Facility Point of Contact (FPOC) shall	• Assure that the activity as described in the IWS/SP is within the scope of the safety basis envelope. • Review the impact of the proposed operation on the facility, occupants, and operations. The FPOC or designee shall concur on IWS/SPs and initial extensions.
ES&H Team shall	• Assign a number to the plan (or use an equivalent electronic system). • Route a draft copy of the plan to the designated reviewers, including the apprpriate ES&H discipline members. An environmental analyst shall be included in the review. • Ensure controls from the applicable Lessons Learned not covered by other safety documentation are appropriately incorporated. • Determine whether the safety plan adequately describes the hazards and controls so that the work can be performed safely and in an environmentally sound manner. • Determine whether the safety plan complies with the Laboratory's ES&H requirements. This includes confirming the applicable controls in the WSSs have been incorporated, as appropriate. • Contact the responsible individual for the IWS/SP if additional information, clarification, or field evaluation is required. The ES&H Team Leader shall concur on IWS/SPs, major changes and initial extensions..

Table 2. IWS/SP Task Responsibilities. (cont'd)

Persons Responsible for the Task	Task To Be Performed
Site 300 or NTS site manager	Shall concur on the IWS/SP in their areas.
Authorizing individual	Shall verify that the safety plan is useable by and understandable to workers. Shall ensure that a pre-start review has occurred before work is started. Shall authorize the IWS/SP, major changes to the IWS/SP and initial extensions of three months. Shall ensure that these documents are distributed to the concerned parties.
Facility Associate Director and HCD Department head	Shall approve extensions beyond three months.

4.0 Implementing Safety Plans

Table 3 identifies the tasks to implement the safety plan in the workplace and the persons who are responsible for carrying out the tasks.

Table 3. Implementing Safety Plans.

Person Responsible for the Task	Task to Be Performed
Responsible Individual	Shall ensure that: • Current approved safety plans and changes are available in the work area(s) and documentation is maintained indicating that appropriate workers have reviewed the plan. • Workers use the safety plan to control activities in the work area. • A prestart review is conducted.
Facility Point of Contact (FPOC)	Shall ensure that: • Current copies of any applicable FSPs are available within the building. • Building activities are controlled in accordance with any existing FSP.
All individuals in the work area	• Before starting work, shall read and understand the plan and sign the Safety Plan Review Form (or use an equivalent electronic system). • Re-read the plan at renewal or major revisions and sign the Safety Plan Review Form.

5.0 Work Standards

5.1 Work Smart Standards

ANSI Z88.2-1992, American National Standard for Respiratory Protection

10 CFR 850, Chronic Beryllium Disease Prevention Program

10 CFR 835, Occupational Radiation Protection/Radiation Protection Program (RPP)

29 CFR 1910, Occupational Safety and Health Standards

29 CFR 1926, Safety and Health Regulations for Construction

DOE 440.1A, Worker Protection Management for DOE Federal and Contractor Employees, Attachment 2, Contractor Requirement Document Sections 1-11, 13-18 (delete item 18.a), 19 (delete item 19.d.3) and 22

5.2 Other Standards

The LLNL Integrated Safety Management System Description, UCRL-AR-132791, is the controlling standard for this document. The ISMS Description is available at

http://cmg.llnl.gov/es_and_h/ism/isms.html

6.0 References

Document 2.1, "Laboratory and ES&H Policies, General Worker Responsibilities, and Integrated Safety Management," in the *ES&H Manual.*

Document 2.2, "Managing ES&H for LLNL Work," in the *ES&H Manual.*

Document 3.1, "Safety Analysis Program," in the *ES&H Manual.*

Document 3.4, "Preparation of Work Procedures," in the *ES&H Manual.*

Document 3.5, "Conduct of Operations for LLNL Facilities," in the *ES&H Manu*al.

Document 41.1, "LLNL Quality Assurance Program," in the *ES&H Manu*al.

7.0 Resources for More Information

7.1 Lessons Learned

Several Lessons Learned have been developed that contain information pertaining to improving how we manage work. These Lessons Learned may be accessed through the ES&H web page at:

http://www-r.llnl.gov/es_and_h/

7.2 Contacts

The following groups can be contacted for additional assistance:

- Directorate ES&H personnel.
- Directorate Assurance Manager.
- ES&H Team.
- Facility Management.

Appendix A

Facility Safety Plan (FSP)

FSP# Date Issued:_____ Date Expires:_____ Title:_____

1.0 Facility Description—*Describe the facility, any unique features and the intended use.*

2.0 Responsibilities and Authorities—*Name the key positions for this facility: Associate Director(s), Assurance Manager(s), Facility Manager, Facility Point of Contact and Alternate, Building Coordinator/Facility Associate, Building AHJ, ES&H Team, WAA Coordinator & Operator, Responsible Person for QA of Facility Safety Systems.*

3.0 General Building Safety Limits and Controls—

3.1 Identify significant systems or equipment important to safety and protection of the environment particular to this facility. Include the credited controls from the facility safety basis documents.

3.2 Identify key safety limits including Technical Safety Requirements (TSRs) and Operational Safety Requirements (OSRs) for this facility. Identify the Hazard Classification for this facility.

3.3 Facility Safety Related Hazards and Control—*Describe facility safety hazards and controls including the following as applicable:*

3.3.1 Access & Egress Control—Describe roof-access information, facility egress issues, designated confined spaces and their specific entry requirements, and evacuation plans.

3.3.2 Hazardous and Radioactive Materials Control—Describe how hazardous and radioactive materials are managed including the accounting method used to ensure controlled material quantities stay within acceptable limits.

3.3.3 Facility Hazards & Controls such as electrical, radiological, radiant sources, nuclear criticality, chemical, biological, cold/heat, pressure, machine shop, cranes/hoists, forklifts, etc. —Describe the hazards and controls used to maintain safe operations within the facility. These hazards and controls must address the generic operations in the entire facility. In addition, they may address specific projects.

3.3.4 Facility Plans—Describe the facility chemical hygiene plan and radiation protection plan, if applicable.

3.3.5 Potentially Contaminated Equipment—Describe facility policies for removing or repair of potentially contaminated equipment.

3.3.6 Working Alone and Food Consumption Policies—Describe facility working-alone and food consumption policies for work areas.

3.3.7 Personal Protective Equipment—Describe facility personal protective equipment required.

3.3.8 Facility Modifications—Describe how facility modifications are managed.

3.4 Facility Related Environmental Concerns and Controls—Describe facility environmental concerns and controls including the following as applicable:

3.4.1 Waste Handling (i.e., hazardous waste, radioactive waste, mixed waste handling, WAAs, SAAs, retention tank systems, permitted treatment units, etc.).

3.4.2 Air Emission Sources (i.e., permitted operations and conditions, exemptions and thresholds, NESHAPs, etc.).

3.4.3 Sanitary Sewer Effluent (e.g., categorical processes, industrial wastewater processes, etc.).

3.4.4 Storm Water Effluent (e.g., SWPPP requirements, etc.).

3.4.5 Other Environmental Concerns such as pollution prevention, endangered species protection, cultural resources management, and NEPA requirements.

4.0 Maintenance, Inspection, and Quality Assurance of Safety Systems and Equipment

4.1 For the equipment identified in Section 3.0, specify the required preventive maintenance and who in the facility is responsible for ensuring that maintenance is performed on these systems. Describe planned inspections, testing, and surveillance methods and frequencies. Specify the QA requirements to ensure operability of these systems.

4.2 Specify or reference plans for maintaining processes and systems identified as credited controls in the safety basis documents.

5.0 Facility-Specific Training Requirements—*List any facility-specific training requirements that are unique to this facility. Include required reading. List visitor-training requirements.*

6.0 Emergency Response Plans and Procedures—*Describe the emergency actions required by building occupants. Attach or reference the Self-Help Plan(s), Evacuation Plan(s) Emergency Call Out Lists, and Emergency response plans and procedures.*

7.0 References—*List other important documents applicable to this facility (e.g., hazards analyses, safety basis documents, Engineering Safety Note, etc.).*

Appendices—*Attach or reference the following:*

- Building Floor Plans
- Safety Plan Review Form
- Controlled and Uncontrolled Distribution Lists
- [Other]

Laboratory management requires that the controls specified in this Facility Safety Plan (FSP) be applied to all operations within this facility.

This FSP was prepared by: _____

Facility Manager or designee signature **Date**

This FSP was concurred by: _____

ES&H Team Leader signature **Date**

_____

Site Manageor or other required signature **Date**

This FSP was approved by _____

Facility Associate Director signature **Date**

Appendix B

Special ES&H Reviews

The specific hazards listed in this appendix require special ES&H review. Work with the ES&H Team to determine the required reviewers for a specific document.

Animals—The Institutional Animal Care and Use Committee shall review any experiment that involves the use of live animals. See Document 13.5, "Vertebrate Animals Used in Research."

http://www.llnl.gov/es_and_h/hsm/doc_13.05/doc13-05.html

Aviation—The Aviation Safety Officer shall review all planned uses of airplanes, rockets, balloons, etc.

Biohazards, Recombinant DNA, and Protein Toxins—The Institutional Biosafety Committee shall evaluate operations involving the use of Select Agents including their genomic materials (listed in Document 13.1, "Biological Controls and Operations,"

http://www.llnl.gov/es_and_h/hsm/doc_13.01/doc13-01.html - appb)

USDA-regulated materials, bloodborne pathogens, recombinant DNA or RNA, and prions. Certain types of protein toxins also require review by the Institutional Biosafety Committee; contact the LLNL Biosafety Officer (ES&H Contact List) for more information.

Electrical Equipment—It is a Laboratory requirement that all electrical equipment and components, including research and development (R&D) equipment, shall be NRTL labeled or listed, or examined and approved by Authority Having Jurisdiction (AHJ) personnel prior to use. If the proposed safety plan involves the use of non-NRTL electrical equipment, AHJ review may be required. See Document 16.3, LLNL Authority Having Jurisdiction Requirements for Approving Electrical Equipment, Installations, and Work" for more information.

Explosives—Document 17.1 requires FSPs to specify or reference criteria for peer review processes for explosives operations and activities based on a set of topical areas. Many explosives operations and activities require peer review. These reviews may be required on an activity basis or may include operations of a specific type within defined limits. **Fissionable Materials, Criticality Hazards—**The Criticality Safety section of the Hazards Control Department shall review all Facility Safety Plans, IWSs, and IWS/SPs that involve facilities or operations that use fissionable materials. Contact your ES&H Team to obtain this review.

Fluorine—The Laboratory Pressure Safety Committee shall review experiments involving fluorine that pose a greater risk of harm than that caused by a 250-ft^3 mixture of expanded volume quantities of 10% fluorine and inert gas.

Human Subjects—The Laboratory's Institutional Review Board shall review any experiment that involves the use of human beings or tissue from humans. See the following web site for more information:

http://www.llnl.gov/HumanSubjects/

New Equipment, System, or Process—An engineering safety note may be required for work that involves designing a piece of equipment, system, or process. An engineering safety note is a management-approved (by division leader or higher) document that describes the anticipated hazards associated with a piece of equipment or a process, documents that the design is safe, and defines testing, inspection, and maintenance requirements. See Document 18.2, "Pressure Vessel and System Design," and the *Engineering Design Safety Standards*, Chapter D.

Offsite Jurisdiction—Activities that take place at an offsite location may be subject to additional reviews by jurisdictions having authority over the activity. For example, use of a high-powered laser to conduct astronomical or meteorological experiments may require the approval of the Federal Aviation Administration. These reviews should be obtained well in advance and documented in the safety plan.

Appendix C

Safety Plan Review Form

Use the following example section at the end of the FSP or IWS/SP as a tool for documenting that personnel have been familiarized with the safety plan.

Lawrence Livermore National Laboratory **Issued/Revised/Effective:**_____

FSP or IWS/SP No. _____ **Expires:** _____

In accordance with the requirements of the *ES&H Manual*, facility management, and/or the responsible individual shall verify and document that personnel working under the direction of this safety plan have been familiarized with the requirements outlined in the enclosed safety plan. Any changes in operations that increase the hazard level, introduce additional hazards, or decrease safety shall not be made until a revision to this safety plan has been reviewed and approved. Upon either the termination of this safety plan or completion of the project that it covers, facility management and/or the responsible individual shall comply with Document 12.7 "Shutdown or Transfer of Facilities, Operations or Associated Equipment," *in the ES&H Manual.*

All individuals listed below affirm that they have been familiarized with the attached safety plan and any applicable Change Memos.

☐ **Initial Review** ☐ **Annual Review** ☐ **Tri-Annual Review** ☐ **Major Change Review** ☐ **Minor Change Review**

Name	Signature	Date

Appendix D

Safety Plan Change Memo Form - Example

October 1, 2002

FSP or IWS/SP XXX.XX

☒ Major Change ☐ Minor Change
Safety Plan Change Memo

TO: Distribution

FROM:

SUBJECT: FSP or IWS/SP XXX.XX Major Change

This Safety Plan Change Memo serves to revise FSP or IWS/SP XXX.XX, effective October 1, 2002, as follows:

Section X.X has been revised as follows:
The scope of work has changed to include the use of a crane for lifting heavy objects in the high bay. The following controls shall be in-place prior to use of the crane as follows:…….

Please make this change in your current copy of the Safety Plan, which expires December 31, 20XX.

Reviewed by:

Facility Management or Responsible Individual	Date (required for minor or major changes)
ES&H Team Leader, Team #	Date (required for a major change)
Site Manager, if applicable	Date (required for a major change only)

Approved by:

FSP: Facility Manager (minor change) Facility AD (major change) Date
IWS/SP: Authorizing Individual (AI) (major change) RI for minor change

Distribution: Minor changes-provide copies to all affected personnel. Major changes—provide copies to everyone in the initial distribution.

Lawrence Livermore National Laboratory

Appendix E

Safety Plan Form

IWS/SP#_____ Title: _____

1. **Quantities of Hazardous or Radioactive Materials and Equipment that Present a Hazard—***To facilitate a proper hazard assessment of the planned work, list or describe the hazardous and/or radioactive materials and/or equipment that present a hazard and are planned for use. Include estimated quantities and storage locations as relevant to the hazard assessment. Listing chemicals in common groups (e.g., acids, bases, etc.) is acceptable. Substances having higher hazards (e.g., acutely toxic, carcinogenic, radioactive, beryllium, etc.) may require more explicit and detailed information. Contact your ES&H Team for further guidance. Note: No sensitive information may be included in this section without prior review by a sensitive subject reviewer.*

2. **Potential Accidents and Consequences—***Identify potential accidents, as appropriate. If there were no controls, what would be the consequences?*

3. **Key ES&H Limits—***Identify key ES&H limits such as:*

   - *Limits established to keep operations within the facility safety basis envelope or to retain compatibility with other nearby operations.* In the case of hazardous or radioactive materials, describe the accounting method used to stay within these limits.
   - *Operational exposure limits (e.g., Permissible Exposure Limits and Threshold Limit Values). Occupational exposure limits should be compared to conclusions from monitoring data or from estimates of exposure potential made by ES&H subject matter experts.*
   - *Hazardous energy limits, such as temperature, pressure, and voltage.*

4. **Hazards and Controls—***Provide further details on the hazards and controls identified in the IWS as requiring a Safety Plan, noting how the hazards will be mitigated to ensure a safe work environment. Controls may include engineering controls (e.g., interlocks, alarms, shielding, etc.), administrative controls (e.g., procedures, signs), and personal protective equipment (e.g., gloves, lab coats, respirators, etc.). Use engineering controls, when needed and preferentially.*

5. **Maintenance, Inspections, and Quality Assurance—***If maintenance, inspections, calibration, or quality assurance activities are necessary to maintain the required controls, this section should be completed. Identify the safety systems uniquely associated with the activity that must be operational for the work to be performed. Note the responsible individual is responsible for ensuring that all required maintenance of safety systems and equipment is conducted at the recommended frequencies and for maintaining the records on this maintenance.*

6. **Emergency Response Plans and Procedures—***Describe any special actions to be taken in the event of an abnormal situation or accident to this operation. Discuss any preplanned actions required by any other group (e.g., Fire Department, Health Services, Hazards Control, Environmental Protection, or Plant Engineering). For operations and processes with significant adverse ES&H impacts, a "safe shutdown plan or procedure" must be written, posted, and available to emergency response personnel.*

7. **References—***List any applicable FSPs, applicable Engineering Safety Notes, operating procedures, Safety Basis documents, etc.*

10/3/02